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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/658,599	09/09/2003	Hiroyuki Yoshimura	FUJI:276	1926
7590 09/12/2005				
ROSSI & ASSOCIATES P.O. Box 826 Ashburn, VA 20146-0826		EXAMINER VU, DAVID		
		ART UNIT 2818 PAPER NUMBER		
DATE MAILED: 09/12/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/658,599

Applicant(s)

YOSHIMURA, HIROYUKI

Examiner

DAVID VU

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-3, 5-7, 10, 12-15, 17, 18 and 20 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Yanagi (US Pat. 6,821,869) in view of Togawa et al. (US Pat. 5,580,639, herein after Togawa).

Yanagi discloses in figs. 11A-11E a method comprising the steps of: providing a semiconductor substrate (col. 11, lines 38-39); forming an resist film 107 on the surface of the substrate 106; forming a photomask 101 on the resist film 107; patterning the photomask 101 corresponding to the predetermined magnetic pattern, developing the photomask 101 for etching the resist film 107 (fig. 11A), and etching resist film 107 to form the pattern of resist film 111 corresponding to the predetermined magnetic pattern, and removing the patterned photomask 101 before etching the substrate 106 (fig. 11B); etching the substrate 106 using the resist patterned 111 as a mask to form grooves corresponding to the predetermined magnetic pattern (fig. 11C); embedding a soft magnetic film 112a in the grooves; wherein the soft magnetic film

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is formed of cobalt or an alloy of iron (Fe) and cobalt (Co) or an alloy of iron, cobalt, and nickel (Ni) (col. 5, lines 10-16); and removing the resist patterned 111 (figs. 11D-E).

Yanagi fails to disclose the resist film is formed of  $\text{SiO}_2$ . However, Togawa teaches the method of manufacturing magnetic patterns (figs. 1-8) comprising the step of forming a thermally grown silicon oxide layer 13 on substrate 12; forming a photoresist film 15 on and in contact with the silicon oxide layer 13, patterning the photoresist film 15 corresponding to the magnetic pattern (fig. 4), developing the photoresist film 15 to form a photoresist mask 15 for etching the silicon oxide layer 13, and etching the silicon oxide layer 13 to form a pattern of silicon oxide film corresponding to the magnetic pattern (fig. 7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Yanagi by forming the silicon oxide resist film as taught by Togawa since the material such as silicon oxide is recognized equivalent material for forming the resist film in a method of manufacturing a semiconductor device.

Yanagi discloses the grooves having a required depth for embedding the magnetic film but fails to disclose the depth of the grooves in the substrate is  $0.25\mu\text{m}$  or  $0.5\mu\text{m}$ . Although the exact depth of the grooves was not specified as recited in claims 10, 11 and 20, it appears that having a specific depth of the grooves as claimed is prima facie obvious due to the fact that one can vary the depth of the grooves in order to achieve a specific magnetic film. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combined process of Yanagi by selecting a depth for the grooves, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the

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optimum or working ranges involves only routine skill in the art. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

2. Claims 9 and 11 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Yanagi (US Pat. 6,821,869) in view of Togawa (US Pat. 5,580,639) as applied to claims 1 and 3 above, and further in view of Groeche et al. (US Pat. 5,021,121, herein after Groeche).

The combination of Yanagi and Togawa fails to disclose the thickness of a thermally grown silicon oxide layer is 0.2  $\mu\text{m}$ . However, Groeche teaches the thickness of a thermally grown silicon oxide layer is about 1 $\mu\text{m}$  (col. 4, line 67 through col. 5, line 6). Although the exact thickness of a thermally grown silicon oxide layer was not specified as recited in claim 9, it appears that having a specific thickness of a thermally grown silicon oxide layer as claimed is prima facie obvious due to the fact that one can vary the thickness of a thermally grown silicon oxide layer in order to achieve a specific resist patterned. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combined process of Yanagi and Togawa in view of Groeche, by selecting a thickness for the resist layer, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

3. Claims 4, 8, 16 and 19 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Yanagi (US Pat. 6,821,869) in view of Togawa (US Pat. 5,580,639) as applied to claims 1 and 3 above, and further in view of Odagawa et al. (US Pat. 6,778,427, herein after Odagawa).

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The combination of Yanagi and Togawa fails to disclose the composition of the alloy is set to satisfy an atomic ratio of Fe: 52 to 72%, Co: 28 to 48%, and Ni: 0 to 3%. However, Odagawa teaches in col. 8, lines 37-43 a soft magnetic film is a NiCoFe alloy ( $\text{Ni}_x\text{Co}_y\text{Fe}_z$ , with  $0.6 \leq x \leq 0.9$ ,  $0.1 \leq y \leq 0.4$ , and  $0.1 \leq z \leq 0.3$  or  $\text{Ni}_{x'}\text{Co}_{y'}\text{Fe}_{z'}$ , with  $0 \leq x' \leq 0.4$ ,  $0.2 \leq y' \leq 0.95$ , and  $0.1 \leq z' \leq 0.5$ ). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combined process of Yanagi and Togawa in view of Odagawa, by selecting a suitable composition for the NiCoFe alloy, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

### Response to Arguments

4. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

### Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the

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mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (571) 272-1798. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David Vu

September 06, 2005.